



50X1-HUM

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If lead oxide is replaced completely, the protective properties against X-rays (as indicated by the lead equivalent) are reduced by the following factors for the barium and antimony compounds mentioned, which serve as a replacement: (a) lithopone, 4-5; (b) barium sulfate, 3-4; (c) antimony trisulfide or antimony pentasulfide, 2.

As the thickness of the rubber becomes greater, its protective qualities are improved.

Replacement of 50% by volume of lead oxide with barium or antimony compounds leads to rubbers with the protective qualities only insignificantly reduced as compared with the corresponding lead oxide rubbers.

Replacement of 25% by volume of lead oxide with barium or antimony compounds practically does not lower the lead equivalent. On the basis of the experimental data obtained, it may be concluded that it is possible to formulate X-ray rubbers by using barium and antimony compounds together with lead oxide. This is important from the technological and economic standpoint, because the cost of lithopone is approximately 3-4 times lower than that of lead oxide. Partial or complete replacement of lead oxide with material which is more readily available will have the additional advantage of reducing the danger of lead poisoning, and therefore of eliminating the measures which must be taken to prevent that poisoning.

It is advisable to investigate this problem further from the following standpoints: (a) production of a number of different grades of rubber scaled down so that they exert a protective effect within different, well-defined ranges of wave lengths; (b) production of X-ray rubbers of greater thickness (4-5 mm), which will make it possible to replace lead oxide to an increased extent; (c) investigation of the possibility of using X-ray rubbers with a lead equivalent of 0.75-0.95, which will also make it possible to replace lead oxide with barium compounds on an extensive scale.

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